CAREER: Theoretical studies of morphological instabilities and evolution in thin solid films

Harris Wong, Louisiana State University, DMR9984950

Thin solid films are the basic structure in computer chips. Most films are made of materials in the form of crystal grains closely packed together. During the manufacturing process, the films are sometimes heated to high temperatures, and the grains can grow. The growth rate needs to be carefully controlled. One of the commonly used method for measuring the growth rate is the Sun-Bauer method. We have improved the analysis of this measurement technique, and obtained better agreement with experiment.

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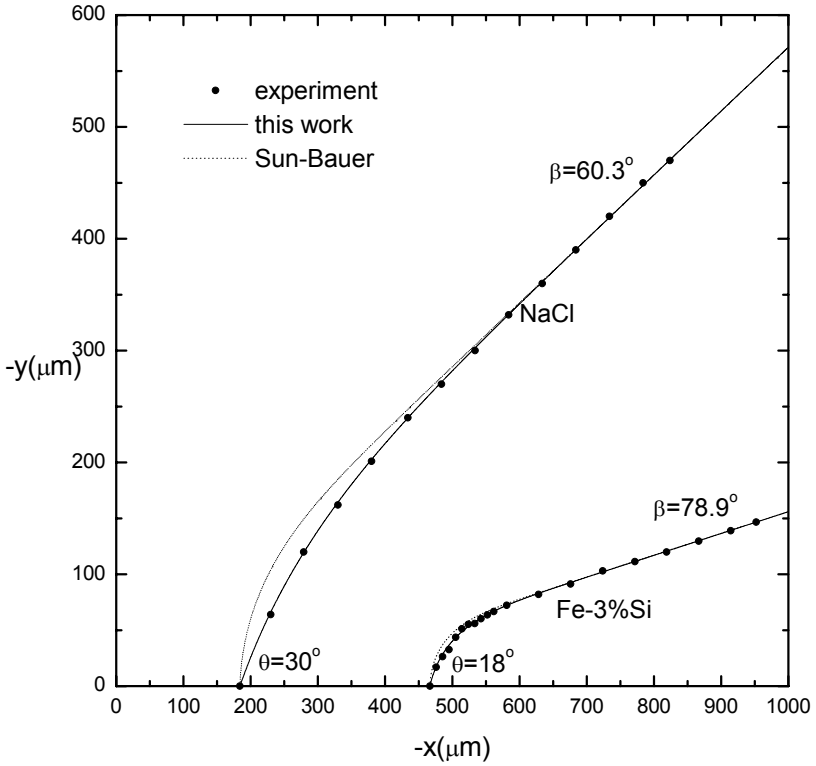

The shape of the boundary between two crystal grains for two different experiments. Our improved model agrees better with the experimental data.

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Education:

Two graduate students (Huifang Zhang and Clara Min) contributed to this work. Huifang received her Master's degree in 2000 and is the recipient of Mechanical Engineering Outstanding Graduate Student Research Award for 1999-2000. Clara is in the third year of her Ph.D. program. She successfully defended her dissertation proposal in the General Examination in October, 2003.

Outreach:

Louisiana has a state-wide science and engineering competition for public and non-public school students in grades 6 through 12. The students select a topic, conduct research, and present their findings first in a regional competition, and then in the state competition. The PI has participated in the competitions as a judge. Through the interactions with the participants, the PI introduced materials research to the general public.